CLAIMS

What is claimed is:

1. A system for saving power in a wireless network, comprising:

an access point having a priority queue;

one or more stations;

an APSD frame having schedule information of a data transmission to the one or more stations;

an algorithm for calculating a transmission power consumption of the data transmission for the stations; and

wherein the access point originates and transmits to the one or more stations the APSD frame of the schedule information having a transmission order based on the receiving power consumption calculation stored within the priority queue of the access point, and wherein the one or more stations selectively awake from a sleep mode for the data transmission therewith based on the schedule.

2. The system of claim 1, wherein the access point is configured to generate a TSPEC element comprising a PS interval for specifying a timing offset relative to the current transmission.

3. The system of claim 1, wherein the access point is further operable unicast an APSD frame to the one or more stations to alter one or more of the scheduled wake-up times of the station in response to errors on the network and to the arrival of higher priority data.

4. The system of claim 1, wherein the access point is further operable broadcast an APSD frame to the one or more stations to alter one or more of the scheduled wake-up times of the station in response to errors on the network and to the arrival of higher priority data.

5. The system of claim 1, wherein the access point and priority queue is operable to allow the access point to ignore current scheduling activities and perform scheduling in response to errors on the network and to the arrival of higher priority data.

6. The system of claim 1, wherein the algorithm for calculating the receiving power consumption of downlink data for the stations is a function of one of a rate of the data transmission, a packet size of the data transmitted, a transmission time of the data transmitted, a packet length, a number of the packets in the transmission, and a combination thereof.

7. The system of claim 1, wherein the algorithm is further operable to aggregate together a plurality of low power transmissions comprising all currently scheduled data to a PS station before calculating the receiving power consumption.

8. The system of claim 1, wherein the transmission order stored in the priority queue of the access point is ordered according to a higher priority assignment for the lowest receiving power consumption.

9. The system of claim 1, wherein the priority queue of the access point is operable to order and enable the lowest transmission power downlink first.

10. The system of claim 9, wherein the priority queue is further operable to order subsequent transmissions based on which transmission has the lowest transmission power.

11. A method of saving power in a wireless network comprising an access point, one or more stations, an APSD frame, and an algorithm for

calculating a receiving power consumption of downlink data for the stations the method comprising:

calculating the receiving power consumption of the data to be downlinked to the stations using the algorithm;

determining a priority queue ordering of the transmissions based on the receiving power consumption calculated for each station;

scheduling an activation delay of the data transmission in the APSD frame for each station based on the transmission order from the receiving power consumption calculations; and

transmitting the data to the one or more stations according to the schedule.

12. The method of claim 11, further comprising:

determining whether the frame queue is empty in the access point;

clearing the MORE_DATA field in the last packet of the power save station if the frame queue is empty in the access point;

disabling the transmission of the APSD frames until the next beacon; and

returning the station to the sleep mode until the next beacon.

13. The method of claim 11, further comprising:

awaking a station from a sleep mode to monitor a beacon from the access point;

determining whether the station's association ID is indicated in the beacon;

returning the station to the sleep mode if the station's association ID is not indicated;

decoding the frames on the wireless channel; and

returning the station to the sleep mode until the next beacon, if the station's association ID matches in a frame and the MORE_DATA bit is set to zero.

14. The method of claim 13, wherein returning the station to sleep mode comprising returning the station to sleep mode after receipt of the APSD, and maintaining the station in sleep mode until the schedule data dictates that the station awaken.

15. The method of claim 13, further comprising:

determining whether downlink data is to be transmitted from the access point to the station if the station's association ID is indicated in the beacon; and

keeping the station awake until APSD frame containing schedule data is received.

16. The method of claim 15, further comprising returning the station to sleep mode after receipt of the APSD frame, and maintaining the station in sleep mode until the schedule data dictates that the station awaken.

17. The method of claim 13, wherein awaking the station to monitor a beacon from the access point, comprises awaking the station at a periodic time to monitor a beacon from the access point.

18. The method of claim 13, wherein determining whether a station's association ID is indicated, comprises determining whether a stations association ID is indicated within a TIM of the beacon.

19. The method of claim 11, further comprising:

sending out the APSD frames containing the schedule data;

clearing a MORE_DATA field in the last packet of the priority queue;

allowing the station to go into sleep mode until the next beacon.